## ANNA UNIVERSITY
### CHENNAI – 600 025
### UNIVERSITY DEPARTMENTS
### R - 2008
### B.E.AERONAUTICAL ENGINEERING
### I & II SEMESTERS CURRICULUM AND SYLLABI

### SEMESTER - I

<table>
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AIM:
To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:
- To enable students improve their vocabulary and employ the words appropriately in different academic and professional contexts.
- To make students comprehend classroom lectures and technically oriented passages.
- To enable students develop suitable reading strategies that could be adopted while reading science related texts.
- To enable students acquire the ability to speak effectively in English in real life situations and work-related situations.
- To train students in academic and professional writing.

UNIT I
Vocabulary - using words in context - use of suffixes to form nouns from verbs and adjectives – adjectives, adverbs - matching words with meanings - Active and passive voices – tenses - simple present, present continuous - comparative adjectives – adverbial forms - Reading text: skimming for general information - specific details - note making - cloze reading – Listening and transferring of information from text to graphic forms - bar charts, flow-charts - Paragraph writing - descriptions using descriptive words and phrases - organising information - Role play - conversational techniques – discussions - oral reporting.

UNIT II
Vocabulary items - words with prefixes (“multi-“, “under-“) - Asking and answering questions, error correction - spelling and punctuation - Reading Comprehension - scanning for information – inferring meaning from context - Listening and guided note-taking - paragraph writing - using notes – giving suitable headings / subheadings for paragraphs – Comparing and contrasting using expressions of comparison - Discussion using creative ideas

UNIT III
Compound nouns - negative prefixes – antonyms – Use of modal verbs – making sentences using phrases – tenses – simple past and present perfect - Reading and guessing meanings in context - Listening and note taking - Channel conversion from text to chart - Writing comparisons - making recommendations - coherence using discourse markers - Discussion - role-play (explaining and convincing)

UNIT IV
Expanding nominal compounds – words with multiple meanings – Error correction - prepositions - use of the prefix “trans-“ - compound adjectives - modal verbs to express probability - simple past and present prefect - Reading – prediction of content - understanding advertisements - scanning the text and comprehension check - Listening for details - Writing definitions – expression of use and purpose - Role-play – discussion - speculating about the future
UNIT V
Formation of nouns, verbs and adjectives from root words – some useful phrases and expressions - cloze exercises - ‘if’ conditional clauses – gerunds (verbal nouns) - Reading for comprehension - intensive reading - Accuracy in listening – listening to discussion on specific issues - Group discussion - role-play (stating, discussing problems and proposing solutions) - Planning a tour - Writing an itinerary - Writing formal letters - letter to the editor

LECTURE – 45  TUTORIAL – 15  TOTAL – 60 PERIODS

TEXTBOOKS

REFERENCES
3. Website: www.uefap.co.uk

MA 9111  MATHEMATICS – I
(Common to all branches of B.E. / B.Tech. Programmes) 3 1 0 4

AIM:
To make available the basic concepts of engineering mathematics, to prepare the student for new concepts to be introduced in the subsequent semesters and to provide the necessary mathematical skills that are needed in modeling physical processes by an engineer.

OBJECTIVES:
• To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
• To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling
• To familiarize the student with functions of several variables which is needed in many branches of engineering
• To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications
• To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage
UNIT I  MATRICES  9+3

UNIT II  INFINITE SERIES  9+3

UNIT III  FUNCTIONS OF SEVERAL VARIABLES  9+3

UNIT IV  IMPROPER INTEGRALS  9+3

UNIT V  MULTIPLE INTEGRALS  9+3

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES
OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology

UNIT I  PROPERTIES OF MATTER  9

UNIT II  ACOUSTICS AND ULTRASONICS  9

UNIT III  THERMAL PHYSICS  9

UNIT IV  APPLIED OPTICS  9

UNIT V  SOLID STATE PHYSICS  9
Nature of bonding – growth of single crystals (qualitative) - crystal systems - crystal planes and directions – expressions for interplanar distance – coordination number and packing factor for simple structures: SC, BCC, FCC and HCP – structure and significance of NaCl, ZnS, diamond and graphite – crystal imperfections: point defects, dislocations and stacking faults.

TOTAL : 45 PERIODS

TEXT BOOKS:
REFERENCES:

AIM:
To gain a sound knowledge of thermodynamics, phase rule, surface chemistry and catalysis, basic organic reaction mechanisms and principles and applications of spectroscopy and nanochemistry.

OBJECTIVES:
To make the student conversant with the
- Applications of second law of thermodynamics.
- Phase rule and various types of alloys
- Surface chemistry and its importance in adsorption and catalysis.
- Basic principles in organic reaction mechanisms and principles and applications of spectroscopy
- Nanochemistry and its applications

UNIT I THERMODYNAMICS

UNIT II PHASE RULE

UNIT III SURFACE CHEMISTRY AND CATALYSIS
UNIT IV ORGANIC REACTIONS AND SPECTROSCOPY

UNIT V NANO CHEMISTRY

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES

GE 9111 ENGINEERING GRAPHICS (Common to All branches of B.E. / B.Tech. Programmes) L T P C
2 0 3 4

OBJECTIVES:
To develop in students the graphic skills that would enable them to communicate the concepts, ideas and design of engineering products
To provide an exposure to the national/international standards related to technical drawings

INTRODUCTION
Importance of graphics in engineering applications – use of drafting instruments – BIS specifications and conventions – size, layout and folding of drawing sheets – lettering and dimensioning
UNIT I  FREE HAND SKETCHING OF ENGG OBJECTS AND CONSTRUCTION OF PLANE CURVE  
3+9=12
Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.

Polygons & curves used in engineering practice– methods of construction– construction of ellipse, parabola and hyperbola by eccentricity method – Cycloidal and involute curves- construction - drawing of tangents to the above curves.

UNIT II  ORTHOGRAPHIC PROJECTION: PROJECTION OF POINTS, LINES AND PLANE SURFACES  
6+9=15
General principles of orthographic projection – first angle projection – layout of views – projections of points, straight lines located in the first quadrant – determination of true lengths of lines and their inclinations to the planes of projection – traces – projection of polygonal surfaces and circular lamina inclined to both the planes of projection

UNIT-III  ORTHOGRAPHIC PROJECTION: PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS  
6+9=15
Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to one plane of projection –change of position & auxiliary projection methods-sectioning of above solids in simple vertical positions by cutting plane inclined to one reference plane and perpendicular to the other and above solids in inclined position with cutting planes parallel to one reference plane – true shapes of sections

UNIT IV  DEVELOPMENT OF SURFACES AND INTERSECTION OF SOLIDS  
6+9=15
Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes. Intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  
4+9=13
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones – principles of perspective projections – projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY)  
3
Introduction to computer aided drafting software packages and demonstration of their use.

L=30   P=45 TOTAL: 75 PERIODS

TEXT BOOKS
REFERENCES


Codes from Bureau of Indian Standards

2. IS 9609 (Parts 0 & 1 )-2001: Technical Products Documentation – Lettering
4. IS 11669-1986 & SP 46-2003: Dimensioning of Technical Drawings
   IS 15021(Parts 1 to 4)-2001: Technical Drawings-Projection Methods

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions one from each unit covering all units of the syllabus
2. All questions will carry equal marks of 20 each making a total of 100
3. Answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solutions within A3 size
4. The examination will be conducted in appropriate sessions on the same day

GE 9112  FUNDAMENTALS OF COMPUTING   L T P C
( Common to all branches of B.E. / B.Tech. Programmes)  3 0 0 3

AIM:
To introduce the basics of computing and the fundamentals of C programming.

OBJECTIVES:

- To introduce the fundamentals of computing systems.
- To introduce the concepts of internet and WWW.
- To teach programming in C.

UNIT I

UNIT II
UNIT III  

UNIT IV  

UNIT V  
Pointers – Dynamic memory allocation – linked list - Applications

TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES


PH 9112  PHYSICS LABORATORY  L T P C
(Common to ALL Branches of B.E. / B.Tech. Programmes)  0 0 2 1

1. Torsional Pendulum- Determination of rigidity modulus of wire and moment of Inertia of disc.
2. Non-uniform bending - Determination of Young’s modulus.
3. Lees’ disc- Determination of thermal conductivity of a bad conductor.
4. Potentiometer - Determination of thermo e.m.f of thermocouple
5. Air wedge- Determination of thickness of a thin sheet of paper.
6. i. Optical fibre - Determination of Numerical Aperture and acceptance angle
    ii. Compact disc - Determination of width of the groove using laser.
7. Acoustic grating - Determination of velocity of ultrasonic waves in liquids.
8. Post office box - Determination of Band gap
9. Spectrometer - Determination of wavelength using grating
10. Viscosity of liquid- Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow.

TOTAL: 30 PERIODS
I. WEIGHING AND PREPARATION OF STANDARD SOLUTIONS
   i) Preparation of molar and normal solutions of the following substances oxalic acid, sodium carbonate, sodium hydroxide, and hydrochloric acid.
   ii) Preparation of buffer solutions: borate buffer, phosphate buffer using Henderson equation.

2. WATER ANALYSIS
   i) Determination of total hardness, temporary & permanent hardness of water by EDTA method.
   i) Determination of DO content by Winkler’s method.
   ii) Determination of alkalinity in a water sample.
   iii) Determination of chloride content of water sample by argentometric method.

3. PH-METRY
   To find out the strength of given hydrochloric acid by sodium hydroxide.

4. CONDUCTOMETRY
   i) Conductometric titration of mixture of acids
   ii) Conductometric precipitation titration using BaCl₂- Na₂SO₄

5. POTENTIOMETRY
   i) Redox titration – Iron Vs. dichromate

6. SPECTROPHOTOMETRY
   i) To determine λmax of a colored solution such as potassium permanganate.
   ii) To determine the iron content of an unknown solution (1,10- phenanthroline/ thiocyanate method)

7. FLAME PHOTOMETRY
   i) To determine sodium and potassium in water.

8. VISCOMETRY
   i) Determination of molecular weight of a polymer

9. WATER POLLUTION
   i) COD analysis of a waste water by dichromate method.

10. KINETICS
    i) Determination of reaction rate constant of acid catalyzed hydrolysis of ester.

11. ADSORPTION
    i) Adsorption of acetic acid on activated charcoal.

**TOTAL: 30 PERIODS**
REFERENCE BOOKS


GE 9113 ENGINEERING PRACTICES LABORATORY
(Common to all Branches of B.E. / B.Tech. Programmes) 0 0 3 2

OBJECTIVE
To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)
1. CIVIL ENGINEERING PRACTICE

Plumbing

Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

Laying pipe connection to the suction side of a pump – inlet.

Laying pipe connection to the delivery side of a pump – outlet.

Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

Wood Work

Sawing, planning and making common joints: T-Joint, Mortise and Tennon joint, Dovetail joint.

Study

Study of joints in door panels, wooden furniture

Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE

Basic household wiring using switches, fuse, indicator – lamp etc.,

Preparation of wiring diagrams
Stair case light wiring
Tube – light wiring
Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS) 15

3. MECHANICAL ENGINEERING PRACTICE

Welding
Arc welding of butt joints, lap joints, tee joints
Gas welding Practice.
Basic Machining
Simple turning, drilling and tapping operations.
Machine assembly Practice.
Study and assembling the following:
Centrifugal pump, mixies and air conditioners.
Demonstration on
(a) Smithy operations like the production of hexagonal bolt.
(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE 9

Soldering simple electronic circuits and checking continuity.
Assembling electronic components on a small PCB and testing.
Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS
AIM:
The aim is to teach the use of computer applications related to office automation and to teach implementation of C programs.

OBJECTIVES:

- To introduce office automation software packages.
- To teach the fundamentals in C programming.

1. Simple OS commands and simple editors for file operations.
2. Word processors for more complex operations, like formatting documents, creating tables and so on.
3. Simple data base packages for creating and manipulating databases.
4. Spread sheet packages for data preparation and analysis.
5. Preparation of reports involving mathematical functions (Income Tax Statement, Mark sheets, Payroll etc.,)
6. C Programs using one dimensional arrays.
7. C Programs using multi-dimensional arrays and pointer data types.
8. Programs using structures, nested structures and union.
10. Programs for passing aggregate data types as parameters between functions.
11. Programs for dynamic memory allocation / deallocation.
12. Programs for self-referential structure – Implementing linked list.

TOTAL: 45 PERIODS
AIM:

To help students specialising in the field of Engineering and Technology develop their proficiency in oral and written communication in Technical English.

OBJECTIVES:

- To enable students develop their critical thinking skills.
- To enable students develop higher order reading skills such as interpreting, evaluating and analysing.
- To enable students develop their active listening skills.
- To enable students participate successfully in Group Discussions.

UNIT I


UNIT II


UNIT III


UNIT IV

UNIT V
Identifying problems, their causes and finding solutions using case studies – creative and critical thinking – levels of thinking – thinking strategies – brainstorming - analytical reasoning skills – evaluative essay – decision making – conflict resolution

English Language Lab (30 Periods)

1. **Listening:** (10)

Recognising English sounds – accents - listening & answering questions - gap filling - listening & note making - listening to telephonic conversations - listening to speeches.

2. **Speaking:** (10)

Pronouncing words & sentences correctly - word stress - conversation practice.

3. **Reading:** (5)

Cloze test - Reading and answering questions - sequencing of sentences.

4. **Writing:** (5)

Correction of errors - Blogging.

**TOTAL : 60 PERIODS**

**TEXTBOOK**

**REFERENCES**
4. Website: www.englishclub.com

**LAB REQUIREMENTS**
1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders
AIM:

To introduce the effective mathematical tools needed for solving engineering problems and to emphasize the underlying mathematical principles in specific situations confronting practicing engineers.

OBJECTIVES:

- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems
- To acquaint the student with the concepts of vector calculus, needed for problems in all engineering disciplines
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I  DIFFERENTIAL EQUATIONS  9+3
Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of Simultaneous linear differential equations with constant coefficients.

UNIT II  VECTOR CALCULUS  9+3
Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface Integral and Volume Integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and Application in evaluating line, surface and volume integrals.

UNIT III  ANALYTIC FUNCTION  9+3
Analytic functions – Necessary and sufficient conditions for analyticity – Properties – Harmonic conjugates – Construction of analytic function – Conformal Mapping – Mapping by functions $w = z + c$, $az$, $\frac{1}{z}$, $z^2$ - Bilinear transformation.

UNIT IV  COMPLEX INTEGRATION  9+3
Line Integral - Cauchy’s theorem and integral formula – Taylor’s and Laurent’s Series – Singularities – Residues – Residue theorem – Application of Residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real axis.

UNIT V  LAPLACE TRANSFORMS  9+3
Existence conditions – Transforms of elementary functions – Basic properties – Transforms of derivatives and integrals – Initial and Final value theorems – Inverse
transforms – Convolution theorem – Transform of periodic functions – Application to solution of linear ordinary differential equations with constant coefficients.

L: 45, T: 15, TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES

PH9164 PHYSICS OF MATERIALS L T P C
3 0 0 3

OBJECTIVE:

• To introduce the essential principles of physics for chemical and related engineering applications.

UNIT I MATERIALS PREPARATION AND PROCESSING 9

UNIT II CONDUCTING MATERIALS 9
Classical free electron theory of metals - Schrödinger wave equation - Time independent and time dependent equations. Physical significance of wave function, particle in a box (in one dimension) – electrons in a metal - Fermi distribution function – Density of energy states – effect of temperature on Fermi energy, Superconducting Phenomena, Properties of superconductors – Meissner effect and Isotope effect. Type I and Type II superconductors, High Tc superconductors – Magnetic levitation and SQUIDS.

UNIT III SEMICONDUCTING MATERIALS 9
Origin of band gap in solids (qualitative) - Concept of effective mass of electron and hole – carrier concentration in an intrinsic semiconductor (derivation) – Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – carrier concentration in n-type and p-type semiconductors (derivation) – variation of Fermi level with temperature and impurity concentration – Compound semiconductors – Hall effect – Determination of Hall coefficient – Solar cells.
UNIT IV MAGNETIC AND DIELECTRIC MATERIALS

UNIT V NEW MATERIALS AND APPLICATIONS

TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES

GE9261 ENVIRONMENTAL SCIENCE AND ENGINEERING
(Common to all branches) L T P C
3 0 0 3

AIM
To create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional endeavour that they participates.

OBJECTIVE
At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and
decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10
Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6
AIDS – women and child welfare – role of information technology in environment and human health – Case studies.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

**REFERENCES**

**GE9151 ENGINEERING MECHANICS**

**OBJECTIVE :**

At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, he should understand the principle of work and energy. He should be able to comprehend the effect of friction on equilibrium. The student should be able to understand the laws of motion, the kinematics of motion and the interrelationship. The student should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

**UNIT I BASICS & STATICS**


**UNIT II EQUILIBRIUM OF RIGID BODIES**

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem - Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples
UNIT III PROPERTIES OF SURFACES AND SOLIDS 9+3

UNIT IV DYNAMICS OF PARTICLES 9+3

UNIT V CONTACT FRICITION AND ELEMENTS OF RIGID BODY DYNAMICS 9+3

L – 45 + T – 15 TOTAL: 60 PERIODS

TEXT BOOK


REFERENCES

OBJECTIVE:
- To impart the knowledge on basic concepts of electrical circuits, electromagnetism and electrical machines

UNIT I BASIC CONCEPTS AND DC CIRCUITS
Ohm's law - Electrical resistance - Series /Parallel resistive circuits - Star/Delta transformations - Kirchoff's law - Node and Mesh analysis - Thevenin's and Norton's theorem.

UNIT II ELECTROMAGNETISM

UNIT III A.C. CIRCUITS
RMS and average value of periodic waves - Form factor - Phase and Phase difference - Simple RC.RL and RLC circuits - series and parallel resonance - power and power factor - introduction to three phase systems – power measurement in 3 phase system.

UNIT IV D.C. MACHINES
Construction details of DC machines - principle of operation of DC generator - EMF equation - characteristics of DC generators - principle of DC motor - Back EMF - Voltage and torque equation - Characteristics of shunt, series and compound motors.

UNIT V A.C. MACHINES

TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES
OBJECTIVE:

- To familiarise the students with various production processes such as casting, forming, machining, welding and unconventional production processes.

UNIT I INTRODUCTION AND CASTING 8

UNIT II METAL FORMING AND POWDER METALLURGY 10

UNIT III CONVENTIONAL MACHINING 10
General principles (with schematic diagrams only) of working, types and commonly performed operations in the following machines – lathe, shaper, planer, milling, drilling and grinding machines – super finishing basics of CNC machines.

UNIT IV WELDING 7
Classification of welding processes – principles and equipment used in the following processes – Arc welding – shielded metal arc welding, gas metal arc welding, ags tungsten arc welding, submerged arc welding, electro slag welding, flux cored arc welding - Resistance welding – Diffusion bonding – Flash butt welding - Thermit welding – soldering – brazing.

UNIT V UNCONVENTIONAL MACHINING PROCESSES 10
Need for unconventional machining processes – principles and application of the following processes – abrasive jet machining, ultrasonic machining, Electro discharge machinery, electrochemical machining, chemical machining, LASER beam machining, Electron beam machining, plasma arc machining- Hybrid machining processes.

TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES


PR 9152 PRODUCTION PROCESS LABORATORY L T P C 0 0 3 2

OBJECTIVE:
To train students in various production processes.

LIST OF EXPERIMENTS:
1. Lathe: Facing, Plain turning, Step Turning
2. Lathe: Taper Turning, Threading, Knurling
3. Lathe: Multi start Threading, Burnishing
4. Shaper: Cube
5. Shaper: Cube, V-Block
6. Drilling: Counter sinking, Counter Boring, Tapping
7. Milling Vertical: Surfacing, Pocket Milling
8. Milling Horizontal: Polygonal shape milling
9. Grinding: Surface & Cylindrical grinding
10. Slotting: Machining an internal spline
11. Deep drawing
12. Foundry Sand Testing

TOTAL: 45 PERIODS

GE 9161 UNIX PROGRAMMING LAB L T P C 0 0 4 2

AIM:
The aim is to introduce working in UNIX environment.

OBJECTIVES:
- To introduce the basic commands in UNIX.
- To teach UNIX shell programming.
- To introduce programming in C with UNIX system calls.

1. Basic Unix commands
2. Simple editors for file operations.
3. Filters-Grep, sed, awk
4. Simple shell programming.
5. Shell programming using complex control structures.
6. C Programs using file system related system calls.
7. C Programs using process related system calls.
8. Programs for inter process communication using pipes, FIFOs.
9. Programs using signals.
10. Programs using shared memory.

TOTAL: 60 PERIODS

TEXT BOOK: